



[7590-01-P]

**NUCLEAR REGULATORY COMMISSION**

**[Docket No. 52-027; NRC-2008-0441]**

**South Carolina Electric & Gas Company and South Carolina Public Service Authority;**

**Virgil C. Summer Nuclear Station, Unit 2**

**AGENCY:** Nuclear Regulatory Commission.

**ACTION:** Grant of exemption; approval of alternative.

**SUMMARY:** The U.S. Nuclear Regulatory Commission (NRC) is granting an exemption from the requirements of the Commission's regulations that require a portion of the operating test, which is part of the operator licensing examination, to be administered in a plant walk-through. The NRC is also approving alternative examination criteria in response to a July 28, 2016, request from South Carolina Electric & Gas Company (SCE&G or facility licensee).

**DATES:** This exemption and approval is effective as of **[INSERT DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]**.

**ADDRESSES:** Please refer to Docket ID **NRC-2008-0441** when contacting the NRC about the availability of information regarding this document. You may obtain publicly-available information related to this document using any of the following methods:

- **Federal Rulemaking Web Site:** Go to <http://www.regulations.gov> and search for Docket ID **NRC-2008-0441**. Address questions about NRC dockets to Carol Gallagher; telephone: 301-415-3463; e-mail: [Carol.Gallagher@nrc.gov](mailto:Carol.Gallagher@nrc.gov). For technical questions, contact the individual listed in the FOR FURTHER INFORMATION CONTACT section of this document.

- **NRC's Agencywide Documents Access and Management System (ADAMS):**

You may obtain publicly-available documents online in the ADAMS Public Documents collection at <http://www.nrc.gov/reading-rm/adams.html>. To begin the search, select "ADAMS Public Documents" and then select "[Begin Web-based ADAMS Search](#)." For problems with ADAMS, please contact the NRC's Public Document Room (PDR) reference staff at 1-800-397-4209, 301-415-4737, or by e-mail to [pdr.resource@nrc.gov](mailto:pdr.resource@nrc.gov). The ADAMS accession number for each document referenced (if it is available in ADAMS) is provided the first time that a document is referenced. The facility licensee's exemption request was submitted to the NRC by letter dated July 28, 2016 (ADAMS Accession No. ML16210A442).

- **NRC's PDR:** You may examine and purchase copies of public documents at the NRC's PDR, Room O1-F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.

**FOR FURTHER INFORMATION CONTACT:** Paul Kallan, Office of New Reactors, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; telephone: 301-415-2809; e-mail: [Paul.Kallan@nrc.gov](mailto:Paul.Kallan@nrc.gov).

**SUPPLEMENTARY INFORMATION:**

**I. BACKGROUND**

South Carolina Electric & Gas Company (SCE&G) and South Carolina Public Service Authority (Santee Cooper) (together, the "VCSNS Owners") are the holders of Combined License Nos. NPF-93 and NPF-94, which authorize the construction and operation of Virgil C.

Summer Nuclear Station (VCSNS) Units 2 and 3, respectively.<sup>1</sup> VCSNS Units 2 and 3 are Westinghouse AP1000 pressurized-water reactors under construction in Jenkinsville, South Carolina. They are co-located with VCSNS Unit 1, which is an operating Westinghouse three-loop pressurized-water reactor.

VCSNS Unit 2 is under construction, and most of the plant systems have not been built. The facility licensee requests an exemption from the portion of section 55.45(b) of title 10 of the *Code of Federal Regulations* (10 CFR), requiring that the “the [operator and senior operator] operating test will be administered in a plant walkthrough.” Pursuant to 10 CFR 55.11, the “Commission may, upon application by an interested person, or upon its own initiative, grant such exemptions from the requirements of the regulations in this part as it determines are authorized by law and will not endanger life or property and are otherwise in the public interest.”

As an alternative to the in-plant methods of testing described in NUREG-1021, “Operator Licensing Examination Standards for Power Reactors,” the facility licensee proposes that applicants for operator and senior operator licenses at VCSNS Unit 2 be tested using discussion and performance methods in combination with plant layout diagrams, maps, equipment diagrams, pictures, and mock-ups. Approval of proposed alternatives is addressed in NUREG-1021, ES-201, “Initial Operator Licensing Examination Process,” Section B, “Background.” As stated therein,

Facility licensees may propose alternatives to the examination criteria contained here and evaluate how the proposed alternatives provide an acceptable method of complying with the Commission’s regulations. The NRC staff will review any proposed alternatives and make a decision regarding their acceptability. The NRC will not approve any alternative that would compromise the agency’s statutory responsibility to prescribe uniform conditions for the operator licensing examinations.

#### *Requirements for Operator Licensing Examinations*

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<sup>1</sup> SCE&G is authorized by the VCSNS Owners to exercise responsibility and control over the physical construction, operation, and maintenance of the facility and is the “facility licensee” as defined in 10 CFR 55.4 for purposes of this evaluation.

The Commission's regulations in 10 CFR part 55, "Operators' Licenses," in part establish procedures and criteria for the issuance of licenses to operators and senior operators of utilization facilities licensed under the Atomic Energy Act of 1954, as amended, and 10 CFR part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants." Pursuant to 10 CFR 55.51, "Issuance of Licenses," "If the Commission determines that an applicant for an operator license or a senior operator license meets the requirements of the Act and its regulations, it will issue a license in the form and containing any conditions and limitations it considers appropriate and necessary." Section 55.33(a) states in part that the Commission will approve an initial application for a license if it finds that (1) the applicant's health is sufficient and (2) the applicant has passed the requisite written examination and operating test in accordance with 10 CFR 55.41, "Written Examination: Operators," or 10 CFR 55.43, "Written Examination: Senior Operators," and 10 CFR 55.45, "Operating Tests." These examinations and tests determine whether the applicant for an operator license has learned to operate a facility competently and safely, and additionally, in the case of a senior operator, whether the applicant has learned to direct the licensed activities of licensed operators competently and safely.

The regulations in 10 CFR 55.40(a) require the Commission to use the criteria in NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," in effect 6 months before the examination date to prepare the written examinations required by 10 CFR 55.41 and 55.43 and the operating tests required by 10 CFR 55.45; 10 CFR 55.40(a) also requires the Commission to use the criteria in NUREG-1021 to evaluate the written examinations and operating tests prepared by power reactor facility licensees pursuant to 10 CFR 55.40(b).

As stated in 10 CFR 55.40(b), power reactor facility licensees may prepare, proctor, and grade the written examinations required by 10 CFR 55.41 and 55.43 and may prepare the operating tests required by 10 CFR 55.45, subject to the following conditions: (1) they shall prepare the required examinations and tests in accordance with the criteria in NUREG-1021 as described in 10 CFR 55.40(a); (2) pursuant to 10 CFR 55.49, they shall establish, implement,

and maintain procedures to control examination security and integrity; (3) an authorized representative of the facility licensee shall approve the required examinations and tests before they are submitted to the Commission for review and approval; and (4) they must receive Commission approval of their proposed written examinations and operating tests.

In accordance with 10 CFR 55.45(a), “[t]he operating test, to the extent applicable, requires the applicant to demonstrate an understanding of and the ability to perform the actions necessary to accomplish a representative sample from among ... 13 [listed] items.” In accordance with 10 CFR 55.45(b):

*Implementation--Administration.* The operating test will be administered in a plant walkthrough and in either--

- (1) A simulation facility that the Commission has approved for use after application has been made by the facility licensee under § 55.46(b);
- (2) A plant-referenced simulator (§ 55.46(c)); or
- (3) The plant, if approved for use in the administration of the operating test by the Commission under § 55.46(b).

The “in a plant walkthrough” portion of 10 CFR 55.45(b) is the subject of the exemption request.

NUREG-1021, Revision 10 (December 2014) (ADAMS Accession No. ML14352A297) establishes the policies, procedures, and practices for examining applicants for operator and senior operator licenses and licensees pursuant to 10 CFR part 55; it contains the examination standards that ensure the equitable and consistent administration of operator licensing examinations. NUREG-1021 is organized by topic into chapters designated with “ES,” which stands for “examination standard.” As relevant here, Chapter 2 (ES-2xx) addresses initial pre-examination activities and Chapter 3 (ES-3xx) addresses initial operating tests. Chapter 3 includes ES-301, “Preparing Initial Operating Tests,” and ES-302, “Administering Operating Tests to Initial License Applicants.”

The NRC examiners and facility licensees use NUREG-1021 together with the applicable NRC knowledge and abilities (K/A) catalog. NUREG-2103, "Knowledge and Abilities Catalog for Nuclear Power Plant Operators: Westinghouse AP1000 Pressurized-Water Reactors," was developed specifically to address the passive nature of the Westinghouse AP1000 design. The NRC K/A catalogs provide the basis for the development of content-valid operator licensing examinations. NUREG-1021, Appendix A, "Overview of Generic Examination Concepts," Section C.1, "Content Validity," describes that a content-valid examination establishes a link between the examination and the duties that the applicants will perform on the job. Also, this section states,

Test items selected for inclusion in an NRC examination should be based on K/As contained in the appropriate K/A catalog. Testing outside the documented K/As can jeopardize the content validity of the examination. Content validity can also be reduced if important K/As are omitted from the examination.

The NRC K/A catalogs contain K/A statements that have been rated for their importance with respect to the safe operation of the plant. An importance rating less than 2.5 represents a K/A statement of limited importance for the safe operation of a plant. Such statements are generally considered as inappropriate content for NRC licensing examinations.

Operator licensing examinations developed using the applicable NRC K/A catalog along with the guidance in NUREG-1021 will sample the 13 items listed in 10 CFR 55.45(a) and also ensure that exam topics are associated with K/A statements of significant importance for the safe operation of the plant. Thus, the examinations will be content-valid.

#### *The Operating Test*

NUREG-1021, Revision 10, ES-301, "Preparing Initial Operating Tests," Section B, "Background," describes that the requirements in 10 CFR 55.45 for the operating test are met by administering a simulator test and a walk-through.

The simulator test is typically administered in a team format with up to three applicants in the main control room simulator. It implements Items 1-8 and 11-13 of 10 CFR 55.45(a) and is

the most performance-based aspect of the operating test. The NRC examiners use the simulator test to evaluate each applicant's ability to safely operate the plant systems under dynamic, integrated conditions.

In contrast, the NRC examiners administer the walk-through to applicants one-on-one. The walk-through consists of two parts: administrative topics and control room/in-plant systems. The administrative topics part of the walk-through implements Items 9-12 of 10 CFR 55.45(a) and covers K/As associated with administrative control of the plant. The control room/in-plant systems part of the walk-through implements the requirements of Items 3, 4, 7, 8, and 9 of 10 CFR 55.45(a) and encompasses several types of systems, including primary coolant, emergency coolant, decay heat removal, auxiliary, radiation monitoring, and instrumentation and control. ES-301 describes that the control room/in-plant systems part of the walk-through is used to determine whether the applicant has an adequate knowledge of plant system design and is able to safely operate those systems. This part of the walk-through focuses primarily on those systems with which licensed operators are most involved (i.e., those having controls and indications in the main control room). To a lesser extent, it also ensures that the applicant is familiar with the design and operation of systems located outside the main control room.

To evaluate an applicant's knowledge and abilities relative to control room/in-plant systems and competence in the administrative topics, the NRC examiners administer job performance measures (JPMs) and, when necessary, ask specific follow-up questions based on the applicant's performance of the JPM. NUREG-1021 defines a JPM as "[a]n evaluation tool that requires the applicant to perform (or simulate) a task that is applicable to the license level of the examination."

Tasks are selected for evaluation in accordance with ES-301, Section D.4, "Specific Instructions for the 'Control Room/In-Plant Systems' Walk-Through." This section directs the NRC examiners and facility licensees to select plant systems from the nine safety functions listed in the applicable NRC K/A Catalog. Table 1, "Plant Systems by Safety Function," in NUREG-

2103 contains a list of the AP1000 plant systems that are important to each of the nine major safety functions. ES-301, Section D.4.a, directs exam writers to (1) select plant systems from among the nine safety functions and then (2) for each plant system selected, select from either the NRC K/A catalog or the facility licensee's site-specific task list a task for which a JPM exists or can be developed. NUREG-1021, Appendix C, "Job Performance Measure Guidelines," contains Form ES-C-2, "Job Performance Measure Quality Checklist," (i.e., the JPM Checklist), which states that every JPM should, among other things, (1) be supported by the facility's job task analysis (i.e., the JPM must require applicants to perform tasks that are included in the facility licensee's site-specific task list, which is the product of its job task analysis) and (2) be "operationally important." To be "operationally important," the JPM Checklist states that a JPM must meet the threshold criterion of 2.5 in NUREG-2103 (i.e., the K/A statement associated with the JPM must have an importance rating of 2.5 or higher), or as determined by the facility and agreed to by the NRC.

Additionally, ES-301, Section E.2.a, "NRC Examiner Review," directs examiners to independently review each operating test for content, wording, operational validity (i.e., test items address an actual or conceivable mental or psychomotor activity performed on the job), and level of difficulty using Form ES-301-3, "Operating Test Quality Checklist." The JPMs must satisfy the criteria on Form ES-301-3 and the JPM Checklist to be administered as part of an operating test.

Per 10 CFR 55.45(b), the operating test will be administered in part in a plant walk-through. Further requirements for the plant walk-through (i.e., the in-plant portion of the operating test) are given in ES-301, Section D.3, "Specific Instructions for the 'Administrative Topics' Walk-through," and Section D.4, "Specific Instructions for the 'Control Room/In-Plant Systems' Walk-Through." Concerning in-plant testing (i.e., "plant walk-through"), ES-301, Section D.4.a. states that from the nine safety function groupings identified in the K/A catalog, the



appropriate number of systems to be evaluated based on the applicant's license level is given by the Table 1, "Systems JPMs," below:<sup>2</sup>

<b>Table 1: Systems JPMs</b>			
<b>License Level</b>	<b>Control Room</b>	<b>In-Plant</b>	<b>Total</b>
RO	8	3	11
SRO-I	7	3	10
SRO-U	2 or 3	3 or 2	5

In addition, ES-301, Section D.4.a states: "Each of the control room systems and evolutions (and separately each of the in-plant systems and evolutions) selected for RO and SRO-I applicants should evaluate a different safety function, and the same system or evolution should not be used to evaluate more than one safety function in each location."

Also, ES-301, Section D.4.b states, "at least one of the tasks conducted in the plant shall evaluate the applicant's ability to implement actions required during an emergency or abnormal condition, and another shall require the applicant to enter the RCA [radiologically controlled area]."

Taken together, the statements in ES-301, Sections D.4.a and D.4.b show that, for purposes of testing, the control room is separate from the plant. Control room system JPMs are typically performed in the control room simulator. Because plant equipment is not controlled from the simulator, applicants can demonstrate knowledge and abilities by using the simulator to perform the actions necessary to accomplish the task during the JPM. The simulator provides feedback to the applicant about the actions that he or she takes during performance of the task.

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<sup>2</sup> In the column labeled "License Level," "RO" means "reactor operator" or "operator;" "SRO-I" means "senior reactor operator – instant" or "senior operator;" and "SRO-U" means "senior reactor operator – upgrade," and refers to an operator applying to upgrade to a senior operator license.

For example, if the applicant operates a switch to start a pump, the simulator provides indications to the applicant that will allow him or her to determine whether the pump has started.

#### *Administration of In-Plant JPMs*

Typically, each JPM begins with the NRC examiner providing the applicant with a cue sheet, which contains the cue for the applicant to begin to perform the task. The cue sheet also provides the applicant with any initial conditions that he or she should assume have been established. After receiving the cue sheet, the applicant leads the NRC examiner to the location in the plant where the task will be performed. Once the applicant arrives at the correct location in the plant, he or she uses the appropriate plant procedure and the plant equipment in that location as a prop to describe to the NRC examiner exactly how he or she would perform the task. In contrast to a control room system JPM, where the applicant performs the task on the control room simulator, the applicant does not actually perform the task during an in-plant system JPM because applicants are not permitted to operate plant equipment while performing a JPM; only licensed control room operators can direct the operation of plant equipment (i.e., an NRC examiner cannot direct the operation of plant equipment). Therefore, as stated in NUREG-1021, ES-301, Attachment 2, Page 21, to successfully complete a JPM in the plant, the applicant must “describe exactly what it takes to perform an action.” As described in NUREG-1021, Appendix C, “Job Performance Measure Guidelines,” Section B.4, “Develop Examiner Cues,” the NRC examiners develop scripted cues to provide the applicant with specific feedback on the equipment’s response(s) to actions the applicant describes that he or she would take. These cues are necessary during JPMs performed in the plant because the applicant is not actually operating any equipment in the plant, and therefore the applicant will not have available the normal indications that would be observed during actual task performance.

Consider the following example. An NRC examiner provides the applicant with a cue sheet that directs him or her to start a standby diesel generator from its local control panel, which is located in the plant (i.e., outside of the main control room), for a monthly equipment

performance test. The applicant first must demonstrate to the NRC examiner that he or she can locate that particular local control panel in the plant by walking the NRC examiner to it. Once at the local control panel, the applicant must then verbally describe exactly how he or she would operate the control panel to perform the task of starting the standby diesel generator. The applicant will use the local control panel as a prop during this discussion (e.g., the applicant could point to a control switch on the control panel to show the NRC examiner that he or she knows which one must be operated during actual task performance to raise the speed of the diesel generator). The applicant would also need to describe how he or she would expect the standby diesel generator to respond to his or her actions and the indications that he or she would use to monitor whether the standby diesel generator responded as expected. Because the equipment is not actually being operated during an in-plant JPM, the NRC examiner provides specific feedback regarding the equipment's reactions to the actions the applicant says that he or she would take.

If the applicant correctly locates the equipment in the plant and describes what it takes to perform the task, then the applicant will successfully complete the JPM. If the applicant demonstrates a lack of understanding of the equipment and procedures, then the NRC examiner will ask follow-up questions, as necessary, to confirm whether the applicant is familiar with the design and operation of that plant system.

Additionally, at least one JPM must be performed in the RCA. This provides an opportunity for the applicant to demonstrate knowledge of significant radiation hazards located in radiation and/or contamination areas inside the RCA and the ability to perform procedures to reduce excessive levels of radiation and to guard against personnel exposure.

#### *Cold Licensing Process*

NUREG-1021, ES-202, Section D.4, "Cold License Eligibility," states, "[c]old licensing is the process used prior to fuel load that provides a consistent method for operations personnel to acquire the knowledge and experience required for licensed operator duties following fuel load."

The cold licensing process is described in Appendix A, "Cold License Training Plan," of NEI 06-13A, "Template for an Industry Training Program Description," Revision 2 (ADAMS Accession No. ML090910554). "Final Safety Evaluation for Topical Report NEI 06-13A, 'Template for an Industry Training Program Description,'" Revision 1, dated December 5, 2008 (ADAMS Accession No. ML082950140), documents the NRC staff's approval of NEI 06-13A for use in combined license applications. The facility licensee incorporated NEI 06-13A, Revision 2, by reference into the VCSNS Units 2 and 3 Updated Final Safety Analysis Report (UFSAR), Chapter 13, "Conduct of Operation" (ADAMS Accession No. ML15196A320). Section 13.2A.3, "Conduct of On-the-Job Training (OJT)," of the VCSNS Units 2 and 3 UFSAR states, "[u]ntil plant construction is completed, acceptable methods for the conduct of on-the-job training include discussion, simulation, and use of mockup equipment and virtual reality technology." Section 13.2A.6, "Cold Licensing Process Applicability and Termination," provides additional guidance on the conduct of OJT:

As plant systems, components, and structures are completed, and as integrated plant operations begin, the systematic approach to training process will be used to adjust cold license class training methods and settings...The purpose is to optimize student learning using actual in-plant training and experience opportunities as they become available.

Additionally, Section 13.2A.7, "Initial Licensed Operator Examination Schedule," states, "[a]dministration of [initial] licensed operator examinations begins approximately 18 months prior to fuel load."

## **II. REQUEST / ACTION**

By letter number NND-16-0266 from April R. Rice, Manager, Nuclear Licensing, New Nuclear Deployment; to the NRC dated July 28, 2016; titled, "Request for an Exemption: Operator Licensing" (ADAMS Accession No. ML16210A442); the facility licensee stated that it seeks to begin operator licensing examinations in September 2016. The facility licensee (1) applied for an exemption from the requirement in 10 CFR part 55 that requires using a plant

walk-through as part of the operating test (i.e., in-plant testing); and (2) proposed alternative examination criteria and methods. SCE&G's request is similar to the request submitted by letter number ND-16-0747 from Ms. Karen Fili, Site Vice President, Vogtle Electric Generating Plant (VEGP) Units 3 and 4; to the NRC dated May 27, 2016; titled, "Southern Nuclear Operating Company Vogtle Electric Generating Plant (VEGP) Units 3 and 4 Revised Request for Exemption and RAI Response: Operator Licensing" (ADAMS Accession No. ML16148A484). Southern Nuclear Company (SNC) is also constructing two Westinghouse AP1000 reactors at VEGP Units 3 and 4 in Burke County, Georgia. On June 24, 2016, the NRC staff granted SNC an exemption from the requirement in 10 CFR part 55 that requires using a plant walk-through as part of the operating test and approved SNC's alternative examination criteria and methods (ADAMS Accession No. ML16174A447).

#### *Application for Exemption*

Because VCSNS Unit 2 is under construction and most of the plant systems have not yet been built, the facility licensee requests an exemption from the requirement in 10 CFR 55.45(b) to administer a portion of the operating test "in a plant walkthrough."

#### *Proposed Alternative*

The facility licensee proposes an alternative to administering in-plant system JPMs in the plant: it proposes to use "cold license training plan evaluation methods" to administer in-plant system JPMs. Specifically, in Enclosure 1, "Plant Walkthrough Exemption," Section 3.1, "Administration of In-Plant JPMs Using Cold License Training Plan Methods," and Section 3.2, "RCA Mockup Alternative to RCA Entry," of letter NND-16-0266, the facility licensee proposes using the following "cold license training plan evaluation methods" in lieu of the plant and plant equipment to administer in-plant system JPMs on an operating test:

- Plant layout diagrams,<sup>3</sup> equipment diagrams and plant maps – these documents will be used as necessary and/or as appropriate to allow an applicant to demonstrate knowledge

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<sup>3</sup> A plant layout diagram typically includes building names, building elevations, and room numbers.

of plant and equipment locations. Applicants will use these tools to describe how they would get to the location of the equipment that is the subject of the JPM instead of walking to the location. Applicants will identify the building, elevation, and room number in the plant where the equipment will be located when construction is complete.

- Maintenance Flow Loop – contains generic plant equipment, such as pumps, valves, and instruments for demonstrating the fundamental knowledge of operation and monitoring of plant equipment.
- Remote Shutdown Workstation – The VCSNS Unit 2 simulation facility includes a Remote Shutdown Workstation that simulates the controls located in the Remote Shutdown Room.
- Radiologically Controlled Area (RCA) mock-up – A training environment that allows applicants to demonstrate knowledge of radiation control subjects. Standards for entry into the mock-up RCA are identical to the actual RCA. The mock-up is used to train outage workers and licensed operators at VCSNS Unit 1. It contains simulated radiation areas and contaminated areas.
- Breaker Lab – the facility licensee expects to add a breaker lab to its training facilities before the end of 2016. It will not be available for the NRC exam planned for September 2016. When it is available, applicants will be able to use the breaker lab to demonstrate knowledge and abilities associated with operating breakers installed in the plant.
- Discuss method – using the procedure and props such as plant layout drawings, mock-ups, maps and pictures of equipment, the applicant will describe the actions he or she would take to operate equipment and explain how the equipment should respond to these actions. Discussion can cover required personal protective equipment, actions, system response and location. Location information can include specifics such as building, elevation, and room.
- Perform method – if the JPM is administered in the breaker lab, the flow loop trainer, or the part of the VCSNS simulation facility modeling the Remote Shutdown Workstation, applicants can perform actions during the JPM.

Additionally, the facility licensee stated that plant location drawings and pictures of plant components not directly related to the task that is the subject of the JPM will also be made available to maintain discriminatory value. Therefore, applicants that perform in-plant system JPMs in the plant as well as applicants that perform them using the proposed method must correctly identify the equipment that is the subject of the JPM to pass the JPM.

#### *Expiration of Exemptions and Alternative*

The facility licensee requested that the exemption expire after the Commission makes its finding in accordance with 10 CFR 52.103(g) (“The licensee shall not operate the facility until the

Commission makes a finding that the acceptance criteria in the combined license are met, except for those acceptance criteria that the Commission found were met under § 52.97(a)(2)”) for VCSNS Unit 2. The facility licensee requested that approval to use the alternative method terminate after the Commission makes its finding in accordance with 10 CFR 52.103(g) for VCSNS Unit 2. Additionally, the facility licensee stated that tasks that are selected to be part of an operating task in accordance with NUREG-1021, ES-301, Section D.4.a and Section D.4.b, where it is possible to both perform OJT for the task in the plant and administer a JPM developed from the task in a plant walk-through, then those JPMs will be administered in the plant.

### **III. DISCUSSION**

#### *Granting of Exemption*

Pursuant to 10 CFR 55.11, the Commission may, upon application by an interested person, or upon its own initiative, grant exemptions from the requirements of 10 CFR part 55 as it determines are (1) authorized by law and (2) will not endanger life or property and (3) are otherwise in the public interest.

#### *1. The exemption is authorized by law.*

Exemptions are authorized by law where they are not expressly prohibited by statute or regulation. A proposed exemption is implicitly “authorized by law” if all of the conditions listed therein are met (i.e., will not endanger life or property and is otherwise in the public interest), and no other provision prohibits, or otherwise restricts, its application. No provisions in law restrict or prohibit an exemption to the requirements concerning the plant walk-through portion of the operating test; the “endanger” and “public interest” factors are addressed later in this evaluation.

The regulations in 10 CFR part 55 implement Section 107 of the Atomic Energy Act of 1954, as amended (AEA), which sets requirements upon the Commission concerning operators’ licenses and states, in part, that the Commission shall “prescribe uniform

conditions for licensing individuals as operators of any of the various classes of ... utilization facilities licensed” by the NRC. These requirements in the AEA do not expressly prohibit exemptions to the portion of 10 CFR 55.45(b) addressing in-plant JPMs and plant walk-throughs.

Preparing and evaluating operator examinations using the criteria in NUREG-1021 is a means of ensuring the equitable and consistent administration of operator licensing examinations for all applicants and thus helps to ensure uniform conditions exist for the operator licensing examinations administered as part of the licensing process. If the exemption is granted, there will be no changes to the preparation and grading of the written examinations, including the generic fundamentals examinations. There will be no changes to the preparation and evaluation of the simulator portions of the operating test. There will be no changes to the administrative portion of the operating tests. Although under the exemption part of the in-plant test will not be administered in the plant, the preparation and grading of the in-plant portion will be unchanged.

Upon balancing the overall effect on uniformity and consistency under the exemption, the NRC staff concludes that the uniform conditions will be maintained; the differences in the testing under the exemption will not prevent equitable administration of the operator licensing examinations or challenge the basis for the NRC examiners’ licensing decisions. Accordingly, the testing will continue to comply with Section 107 of the AEA. Accordingly, the NRC staff has determined that granting of the facility licensee’s proposed exemption will not result in a violation of the AEA, or the Commission’s regulations. Therefore, the exemption is authorized by law.

## *2. The exemption will not endanger life or property*

The exemption will not change the fundamental findings needed to issue an operator’s or senior operator’s license to an applicant. As stated in 10 CFR 55.33 “Disposition of an initial application,”



(a) *Requirements for the approval of an initial application.* The Commission will approve an initial application for a license pursuant to the regulations in this part, if it finds that –

...

(2) *Written examination and operating test.* The applicant has passed the requisite written examination and operating test in accordance with §§ 55.41 and 55.45 or 55.43 and 55.45. These examinations and tests determine whether the applicant for an operator's license has learned to operate a facility competently and safely, and additionally, in the case of a senior operator, whether the applicant has learned to direct the licensed activities of licensed operators competently and safely.

Competent and safe operators protect against endangerment of life or property.

Accordingly, where the tests adequately determine who is competent, those tests are protective of and do not endanger life or property.

The exemption from the requirement in 10 CFR 55.45(b) that the operating test be administered partially “in a plant walkthrough” will not endanger life or property mainly because 10 CFR 55.45(a) will still require the applicant to demonstrate an understanding of and the ability to perform the actions necessary to accomplish a representative sample of tasks. As required by 10 CFR 55.45(a), the content of the operating test will continue to be identified, in part, from learning objectives derived from a systematic analysis of licensed operator or senior operator duties performed by each facility licensee and contained in its training program and from information in the Final Safety Analysis Report, system description manuals and operating procedures, facility license and license amendments, Licensee Event Reports, and other materials requested from the facility licensee by the Commission. Although applicants will not be tested while physically located in front of installed in-plant equipment until the Commission makes its finding in accordance with 52.103(g), the knowledge and abilities applicants must demonstrate to pass the operating test will not change.

Accordingly, there is no endangerment of life or property as a result of the exemption.

### 3. *The exemption is otherwise in the public interest*

The Commission's values guide the NRC in maintaining certain principles as it carries out regulatory activities. These principles focus the NRC on ensuring safety and security while

appropriately balancing the interests of the NRC's stakeholders, including the public and licensees. These principles include Independence, Openness, Efficiency, Clarity, and Reliability. Whether granting of an exemption to the requirement to perform in-plant system JPMs in the plant would be in the public interest depends on consideration and balancing of the foregoing factors.

### *Efficiency*

The public and licensees are all entitled to the best possible management and administration of regulatory activities. Regulatory activities should be consistent with the degree of risk reduction they achieve. Where several effective alternatives are available, the option that minimizes the use of resources should be adopted.

The NRC staff considered two options to determine whether one would minimize the use of resources and/or minimize risk: (1) grant the exemption to the plant walk-through requirement and administer operator licensing examinations prior to completion of VCSNS Unit 2, or (2) deny the exemption and wait until the completion of construction to administer the operator licensing examinations. For either option, the same number of NRC examiners will be required to administer the operator licensing examinations at VCSNS Unit 2 prior to fuel load. Thus, the use of resources is not minimized by administering exams before the plant is built. Accordingly, the exemption is neutral with respect to the public's interest in efficiency.

### *Clarity*

Regulations should be coherent, logical, and practical. There should be a clear nexus between regulations and agency goals and objectives whether explicitly or implicitly stated. Here, the goal of the agency is to determine whether applicants for a license have learned to operate a facility competently and safely. Because the applicants must still demonstrate familiarity with the design and operation of systems located outside the main control room using the method proposed by the facility licensee, it is not necessary to perform the in-plant system

JPMs within the completed VCSNS Unit 2 to achieve this goal. Accordingly, this factor shows that the exemption maintains the public interest in clarity.

### *Reliability*

Regulations should be based on the best available knowledge from research and operational experience. Systems interactions, technological uncertainties, and the diversity of licensees and regulatory activities must all be taken into account so that risks are maintained at an acceptably low level. Once established, regulation should be perceived to be reliable and not unjustifiably in a state of transition. Regulatory actions should always be fully consistent with written regulations and should be promptly, fairly, and decisively administered so as to lend stability to the nuclear operational and planning processes.

If a sufficient number of applicants do not pass the exams, then the facility licensee may not have a sufficient number of personnel available for fuel load due to the mandatory time periods of 2 months to 2 years from the time of denial before an applicant may re-apply. Specifically per 10 CFR 55.35(a), an applicant whose application for a license has been denied because of failure to pass the written exam or the operating test, or both, may file a new application 2 months after the date of denial. The new application must include a statement signed by an authorized representative of the facility licensee that states in detail the extent of the applicant's additional training since the denial and certifies that the applicant is ready for re-examination. If the candidate fails a second time, then the applicant may file a third application 6 months after the date of denial, and may file further successive applications 2 years after the date of denial of each prior application. In Enclosure 1, "Plant Walkthrough Exemption," Section 6.3, "Otherwise in the Public Interest," of letter NND-16-0266, the facility licensee stated, "[t]he current estimated forecast date of plant construction completion...is expected not earlier than June 2018." Fuel load is scheduled for Quarter 4 of 2018; however, the facility licensee also stated that this is subject to change due to "developments during construction." If exams

commence in June 2018, and fuel load occurs in late 2018, then there will only be at most 6 months between the time when licensing decisions will be made and fuel load. If a sufficient number of applicants do not pass the operating test, then the facility licensee must follow the re-application process in 10 CFR 55.35(a) or start training new candidates. As stated in Enclosure 1, Section 6.3, "Otherwise in the Public Interest," of letter NND-16-0266, initial license training lasts approximately 24 months. Starting the exam process in 2016 will provide a sufficient amount of time for retraining applicants or training new candidates. Thus, granting the exemption will lend stability to the nuclear operational and planning process in that the individual operator licensing decisions will be made much sooner than otherwise would be possible, allowing the facility licensee to follow 10 CFR 55.35 in an orderly manner.

With respect to risk reduction, granting of the exemption will not require the NRC examiners or the applicants to enter the actual RCA, and therefore, the risk of radiation exposure for applicants and NRC examiners will be reduced to zero. Although NRC examiners and applicants typically do not receive any significant exposure to radiation or contamination during the conduct of operating tests administered inside the RCA, the NRC staff concludes that reducing the risk of exposure to zero aligns with the agency's goal of maintaining exposure to ionizing radiation as low as is reasonable achievable (ALARA). Accordingly, this factor shows that the exemption favors the public's interest in reliability.

### *Independence*

Nothing but the highest possible standards of ethical performance and professionalism should influence regulation. However, independence does not imply isolation. All available facts and opinions must be sought openly from licensees and other interested members of the public. The many and possibly conflicting public interests involved must be considered. Final decisions must be based on objective, unbiased assessments of all information, and must be documented with reasons explicitly stated.

With the granting of this exemption, the NRC staff will still continue to independently assess whether the applicants at VCSNS Unit 2 have the skills, knowledge, and abilities necessary to operate the plant safely and competently. The operator licensing decisions will continue to be based on the NRC examiners' objective, unbiased assessments of each applicant's performance, which will be documented in accordance with NUREG-1021, ES-303, "Documenting and Grading Initial Operating Tests." Accordingly, this factor shows that the exemption maintains the public interest in independence.

#### *Openness*

Nuclear regulation is the public's business, and it must be transacted publicly and candidly. The public must be informed about and have the opportunity to participate in the regulatory processes as required by law. Open channels of communication must be maintained with Congress, other government agencies, licensees, and the public, as well as with the international nuclear community.

Granting the exemption allows the portion of the operating test that would otherwise be performed in the plant to be administered in a location other than the plant. The operator licensing examination process described in NUREG-1021 will still be followed using the alternate method proposed by the facility licensee. Therefore, this factor shows that the exemption maintains the public's interest in openness.

#### *Balancing of Factors*

Accordingly, the balancing of these factors shows that the exemption is otherwise in the public interest.

#### *Conclusion*

The Commission concludes that the exemption is (1) authorized by law and (2) will not endanger life or property and (3) is otherwise in the public interest. Therefore, the Commission

grants SCE&G an exemption from the requirement of 10 CFR 55.45(b) to administer a portion of the operating test “in a plant walkthrough.”

*Approval of Alternative*

NUREG-1021, ES-201, Section B, “Background,” states,

Facility licensees may propose alternatives to the examination criteria contained here and evaluate how the proposed alternatives provide an acceptable method of complying with the Commission’s regulations. The NRC staff will review any proposed alternatives and make a decision regarding their acceptability. The NRC will not approve any alternative that would compromise the agency’s statutory responsibility to prescribe uniform conditions for the operator licensing examinations.

As discussed below, the facility licensee’s proposed alternatives provide an acceptable method of complying with the Commission’s regulations and will not compromise the agency’s statutory responsibility to prescribe uniform conditions for the operator licensing examinations.

NUREG-1021, Appendix A, “Overview of Generic Examination Concepts,” Section B, “Background,” discusses internal and external attributes of an examination and their relationship to uniform conditions. The internal attributes of an examination include its level of knowledge (LOK), level of difficulty (LOD), and the use of exam question banks. The external attributes of an examination include the number and types of items, the length of the examination, security procedures, and proctoring instructions. Appendix A states,

If the internal and external attributes of examinations are allowed to vary significantly, the uniform conditions that are required by Section 107 of the Atomic Energy Act of 1954, as amended, and the basis upon which the NRC’s licensing decisions rest are challenged. The NRC must reasonably control and structure the examination processes to ensure the integrity of the licenses it issues.

In order to determine whether uniform conditions for licensing individuals as operators and senior operators at VCSNS Unit 2 will be maintained using the method proposed by the facility licensee, the NRC staff performed two actions. First, the NRC staff identified the differences between performing in-plant system JPMs in the plant and the facility licensee’s proposed method of performing in-plant system JPMs. These are listed in the table below.

<b>Table 2: Summary of Differences</b>		
<b>#</b>	<b>Performing In-Plant System JPMs in the Plant</b>	<b>Facility Licensee's Proposed Method of Performing In-Plant System JPMs</b>
<b>1</b>	Applicants demonstrate knowledge of equipment locations by walking the NRC examiner to the location of the equipment that is the subject of the JPM in the plant.	In lieu of walking the NRC examiner to the equipment that is the subject of the JPM, applicants demonstrate knowledge of equipment locations by using plant layout diagrams, equipment diagrams, and maps to describe to the NRC examiner how they would get to the location of the plant equipment that is the subject of the JPM. Applicants identify the building, elevation, and room number associated with the plant equipment that is the subject of the JPM.
<b>2</b>	Applicants use the plant equipment as a prop while they describe and how to operate the equipment to perform the task.	In lieu of using plant equipment as a prop, applicants use pictures of equipment or a mock-up of the equipment as a prop while they describe and simulate how to operate the equipment to perform the task.
<b>3</b>	Applicants must enter the RCA for at least one JPM.	In lieu of entering the RCA in the plant, applicants enter a mock-up RCA for at least one JPM.

Second, the NRC staff evaluated whether the differences could cause the internal and external attributes of the in-plant system JPMs administered to applicants at VCSNS Unit 2 prior to the completion of plant construction to vary significantly from those administered to applicants at VCSNS Unit 2 after the completion of construction. The evaluation is documented below.

#### *Evaluation of Internal Attributes*

*Level of Knowledge:* As stated in NUREG-1021, Appendix A, Section C.3.c, "Level of Knowledge Versus Level of Difficulty," LOK represents the range of mental demands required to answer a question or perform a task. It is a continuum of mental rigor that ranges from retrieving fundamental knowledge, which requires demonstrating a relatively low LOK, to retrieving that knowledge and also understanding, analyzing, and synthesizing that knowledge with other knowledge, which requires demonstrating a relatively high LOK. Test items that

require an applicant to demonstrate a high LOK require multiple mental processing steps, which are usually the recall and integration of two or more pieces of data.

In-plant system JPMs performed in the plant are high LOK test items because they require applicants to recall knowledge such as the location of plant equipment, which was acquired during the initial training program, and also to demonstrate, by walking the NRC examiner to the correct equipment in the plant and by describing the actions that they would take to operate the equipment, an understanding of and familiarity with the design and operation of that equipment. Applicants must also respond to the cues provided by the NRC examiner during the JPM. To successfully complete the JPM, the applicant must be able to analyze the information provided by these cues, apply knowledge of the design and operation of the equipment to determine the appropriate action(s), and then describe the action(s) to the NRC examiner.

The NRC staff determined that the three differences listed in Table 2 do not cause the LOK that an applicant at VCSNS Unit 2 must demonstrate during in-plant system JPMs administered prior to the completion of plant construction to vary significantly from the LOK that an applicant must demonstrate during in-plant system JPMs performed after the completion of construction at VCSNS Unit 2 for the following reasons.

- As shown in Difference #1 in Table 2, the facility licensee proposes that applicants at VCSNS Unit 2 demonstrate knowledge of equipment locations by using plant layout diagrams, equipment diagrams, and/or maps to show the NRC examiner how they would get to the location in the plant where the task would be performed. The facility licensee stated in Enclosure 1, "Plant Walkthrough Exemption," Section 5.5, "Conclusion," of letter NND-16-0266 that the proposed method of performing in-plant system JPMs "does not impact the ability to maintain equitable and consistent testing under uniform conditions because license applicants will be evaluated using the same methods employed during their training." Therefore, the NRC staff concludes that this method will require applicants at VCSNS Unit 2 to recall and



demonstrate knowledge of plant equipment location(s), which were addressed in the training program, to successfully complete the JPM even though the JPM will not be performed in the plant.

- As shown in Difference #2 in Table 2, the facility licensee proposes that applicants at VCSNS Unit 2 describe how they will operate the equipment and explain how they expect the equipment and systems to respond to their actions using props such as pictures of the equipment or a mock-up equipment in lieu of the actual equipment in the plant. Just as during a JPM in the plant, NRC examiners will need to provide scripted cues to the applicants in response to the actions the applicants say that they would take. The applicants will have to analyze the information provided by these cues, apply knowledge of the design and operation of the equipment to determine the appropriate action(s), and then describe the action(s) to the NRC examiner. Therefore, the NRC staff concludes that this method will require applicants at VCSNS Unit 2 to describe the actions that they would take to operate the equipment and analyze information provided by cues to successfully complete the JPM even though the JPM will not be performed in the plant.

- As shown in Difference #3 in Table 2, applicants at VCSNS Unit 2 will be required to demonstrate how to enter the RCA. The facility licensee has established a mock-up of the RCA that contains simulated radiation areas and contaminated areas, and “standards for entry into the mockup RCA are identical to an actual RCA.” Therefore, the NRC staff concludes that this method will require applicants at VCSNS Unit 2 to demonstrate knowledge of significant radiation hazards located in radiation and/or contamination areas inside the RCA and the ability to perform procedures to reduce excessive levels of radiation and to guard against personnel exposure even though the JPM will not be performed in the plant.

Accordingly, the NRC staff concludes that the facility licensee’s proposed method of performing in-plant system JPMs will not cause the LOK of the in-plant system JPMs

administered to applicants at VCSNS Unit 2 prior to the completion of plant construction to vary significantly from those administered to applicants at VCSNS Unit 2 after the completion of construction.

*Level of Difficulty.* As stated in NUREG-1021, Appendix A, Section C.3.c, “Level of Knowledge Versus Level of Difficulty,” the NRC examiners evaluate a test item’s LOD “to ensure that the item can help discriminate between safe and unsafe operators.” “Safe operators” are the applicants who pass all portions of the operator licensing examination in accordance with the grading criteria identified in NUREG-1021, ES-303, “Documenting and Grading Initial Operating Tests.” To pass the walk-through portion of the operating test, applicants must earn a score of 80% or higher. Thus, NUREG-1021 recommends that the difficulty for individual test items range between 70% and 90% (i.e., 70-90% of applicants could successfully perform the test item). To achieve this, NUREG-1021 states that the NRC examiners must integrate the following concepts: the LOK of the test item, the operational validity of the test item (i.e., the test item requires applicants to perform mental or psychomotor activities that they will have to perform on the job), the ability of distractors to distract the examinees, and the examinees’ past performance on items of similar difficulty. Appendix A acknowledges that “assigning a level of difficulty rating to an individual test item is a somewhat subjective process.”

The NRC staff determined that the three differences listed in Table 2 do not cause the LOD that an applicant at VCSNS Unit 2 must demonstrate during in-plant system JPMs administered prior to the completion of plant construction to vary significantly from the LOD that an applicant must demonstrate during in-plant system JPMs performed after the completion of construction at VCSNS Unit 2 for the following reasons.

- As shown in Difference #1 in Table 2, the facility licensee proposes that applicants at VCSNS Unit 2 demonstrate knowledge of equipment locations by using plant layout diagrams, equipment diagrams, and/or maps to (1) to describe to the NRC examiner how they would get

to the location of the plant equipment that is the subject of the JPM and to (2) correctly identify the building, elevation of the building, and room number where the equipment will be located in VCSNS Unit 2. Additionally, the facility licensee proposes that “plant layout diagrams and/or pictures of components not directly related to the task will also be made available to the applicant to maintain discriminatory value...”

When an in-plant system JPM is performed in the plant, applicants must physically walk the NRC examiner to the correct location in the plant where the task will be performed. Applicants must choose the correct location from among all of the other accessible plant locations. Similarly, applicants at VCSNS Unit 2 must choose the correct plant layout diagram(s), equipment diagrams and/or map(s) from a set of diagrams and/or maps in order to show the NRC examiner how they would locate the equipment in the plant.

If an applicant at an operating reactor has spent a sufficient amount of time in the plant becoming familiar with its layout and the location of plant equipment, then walking the NRC examiner to the correct location during a JPM in the plant should be a relatively easy task. Otherwise, this will be a relatively difficult task, and the applicant may not be able to perform the JPM if he or she cannot find the equipment that is the subject of the JPM. Similarly, if an applicant at VCSNS Unit 2 has spent a sufficient amount of time becoming familiar with the plant layout diagrams and maps, then using these tools to show the NRC examiner how he or she would access the equipment should be a relatively easy task. Otherwise, this will be a relatively difficult task, and the applicant may not be able to continue with the JPM because he or she will not successfully demonstrate the ability to access the equipment. In both cases, the applicants will either be able to demonstrate knowledge to the NRC examiner, or they will not be able to demonstrate knowledge. The NRC staff concludes that both methods require applicants to select the correct location of plant equipment from among other choices, and therefore the NRC examiners will still be able to discriminate between operators that have this knowledge and those that do not. Therefore, the LOD of the two methods is comparable.

Also, the NRC staff considered the implications for the testing process of physically walking in the plant to a specific location as compared to using plant layout diagrams and/or maps to show and describe the route that would be taken to find the correct location impacted LOD. Both methods require an applicant to recall and show knowledge of plant locations to the NRC examiner. However, applicants at plants that have been constructed will have spent time becoming familiar with the routes through the plant that they must take to access equipment during the conduct of OJT in the plant. During an in-plant system JPM in the plant, they will likely be able to recall the route(s) they have previously traveled by relying on unique visual clues available in the plant such as signage and various access control points that they must pass through to navigate their path to the equipment that is the subject of the JPM. They may also possibly rely on muscle memory to some extent to locate the equipment that is the subject of the JPM. Additionally, NUREG-1021, Appendix E, "Policies and Guidelines for Taking NRC Examinations," contains directions that NRC examiners provide to applicants and licensed operators prior to every NRC examination. Appendix E, Section C.3, states,

The operating test is considered "open reference." The reference materials that are normally available to operators in the facility and control room (including calibration curves, previous log entries, piping and instrumentation diagrams, calculation sheets, and procedures) are also available to you during the operating test.

Plant layout diagrams and site maps are normally available to operators. Thus, applicants at plants that have been constructed may use plant layout diagrams and site maps to help them to locate the equipment that is the subject of the JPM if they cannot recall the location of the equipment from memory.

Unlike applicants at plants that have been constructed, the applicants at VCSNS Unit 2 that take operator licensing examinations prior to the completion of plant construction will only use plant layout diagrams and maps to describe the route they would take to access the plant equipment. This method requires applicants to stand in front of a document and trace or identify the route that would be taken. This method is different from actually walking to a

location in the plant because (1) visual clues that would be available to applicants in the plant will not be available, and (2) this method requires applicants to use fewer motor skills, and thus it is not likely that applicants will be able to use any muscle memory. This may increase the LOD. However, the facility licensee stated in Enclosure 1, "Plant Walkthrough Exemption," Section 5.5, "Conclusion," of the letter NND-16-0266 that the proposed method of performing in-plant system JPMs will "not impact the ability to maintain equitable and consistent testing under uniform conditions because license applicants will be evaluated using the same methods employed during their training." The NRC staff concludes that any increase in LOD as a result of only using plant layout diagrams and maps to demonstrate knowledge of locations will be offset by the fact that the applicants will have been specifically trained on the locations of plant equipment with these tools.

- As shown in Difference #2 in Table 2, applicants will use pictures of equipment or a mock-up of the equipment as a prop while they describe and simulate how to operate the equipment to perform the task. Instead of pointing to a piece of equipment in the plant and verbally describing how to operate it, the applicant will either point to a diagram or picture of the equipment as a prop while describing how to operate it or use a piece of mock-up equipment to actually perform the task required by the JPM. The facility licensee proposes that diagrams and pictures of components not directly related to the task will also be made available to the applicant so that the applicant must make a choice. The NRC staff determined that the facility licensee's proposed method of performing in-plant system JPMs will require an applicant to select the correct piece of equipment from among other options, which is similar to having to make that selection in the plant. Therefore, the NRC examiners will still be able to discriminate between operators that have this knowledge and those that do not, and thus the LOD of the two methods is comparable.

The NRC staff also considered the difference in the quality of the props that the facility licensee proposes to use compared to the quality of the plant equipment as a prop.

Enclosure 2, "Information Related to the Vogtle Electric Generating Plant (VEGP) Units 3 and 4 NRC Requests for Additional Information (RAIs) on VEGP Plant Walkthrough Exemption," contains Table E-2, which lists tasks from the VCSNS Unit 2 site-specific task list for which an in-plant system JPM exists or could be developed. The NRC staff reviewed Table E-2 and determined that the maintenance flow loop trainer, the RCA mock-up, the Remote Shutdown Workstation, and the breaker lab (when it is available) can be used as props during some JPMs developed from the tasks listed in Table E-2. These props are realistic representations of certain pieces of plant equipment and are therefore equivalent to the actual plant equipment.

However, these props will not be able to be used for every in-plant system JPM because the in-plant tasks listed in Table E-2 include tasks unrelated to breaker operation, remote plant shutdown, the RCA, or plant components modeled in the flow loop trainer. For these tasks, which include tasks related to breaker operation that are developed into JPMs on operating tests administered before the breaker lab is available, the facility licensee proposes to use equipment diagrams or pictures of plant equipment as props. Pictures may not be the same size as the actual plant equipment, or they might not provide the same visual detail to an applicant that would be provided by the actual plant equipment. This could make these props more difficult to use compared to the actual plant equipment. However, because the facility licensee proposes to use the same methods during the administration of in-plant system JPMs that have been used in the training program, the NRC staff concludes that any increase in LOD as a result of using pictures or equipment diagrams to demonstrate knowledge will be offset by the fact that the applicants have used these props during their training.

- As shown in Difference #3 in Table 2, applicants will have to enter a mock-up of the RCA for at least one in-plant JPM. As stated in the facility licensee's submittal, the "standards for entry into the mockup RCA are identical to an actual RCA." Therefore, the NRC staff concludes that this difference has no impact on the LOD of the in-plant system JPMs because

there is no difference between demonstrating the ability to enter the actual RCA and demonstrating the ability to enter a mock-up of the RCA.

Accordingly, the NRC staff concludes that the facility licensee's proposed method of performing in-plant system JPMs will not cause the LOD of the in-plant system JPMs administered to applicants at VCSNS Unit 2 prior to the completion of plant construction to vary significantly from those administered to applicants at VCSNS Unit 2 after the completion of construction.

*Use of Exam Banks:* NUREG-1021, Form ES-301-2, "Control Room/In-Plant Systems Outline," contains criteria for the use of JPMs in the facility licensee's exam bank that may be used on operator licensing examinations. In Enclosure 1, "Plant Walkthrough Exemption," Section 5.3, "Discrimination Validity," the facility licensee stated, "[a]ny questions, discussions, or other cold licensing methods used for task evaluation will have no impact on how the examination bank is used." The NRC staff also concludes that the facility licensee's proposed method of performing in-plant system JPMs does not impact the use of exam banks because the facility licensee's proposed method of administering JPMs has nothing to do with the selection of JPMs from its exam bank.

In summary, the NRC staff concludes that the facility licensee's proposed method of performing in-plant system JPMs does not significantly impact the internal attributes of the in-plant system JPMs that will be administered to applicants at VCSNS Unit 2 prior to the completion of plant construction as compared to the in-plant system JPMs administered to applicants to applicants at VCSNS Unit 2 after the completion of construction.

#### *Evaluation of External Attributes*

The external attributes of an examination include the number and types of items (e.g., in-plant system JPMs), the length of the examination, security procedures, and proctoring instructions. The facility licensee is not proposing to alter the number or types of items, the length of the examination, security procedures, or proctoring instructions for any part of the

operator licensing examination. Therefore, the NRC staff concludes that the external attributes of the in-plant system JPMs that will be administered to applicants at VCSNS Unit 2 prior to the completion of plant construction will be the same as those administered to applicants at VCSNS Unit 2 after the completion of construction.

#### *Summary of Evaluation of Internal and External Attributes*

In summary, the NRC staff concludes that the facility licensee's proposed method of performing in-plant system JPMs does not cause the internal and external attributes of the in-plant system JPMs administered to applicants at VCSNS Unit 2 prior to the completion of plant construction to vary significantly from those administered to applicants at VCSNS Unit 2 after the completion of construction. Because in-plant system JPMs are a portion of the operator licensing examination, the NRC staff also concludes that the facility licensee's proposed method does not cause the internal or external attributes of the operator licensing examinations that will be administered to applicants at VCSNS Unit 2 prior to the completion of plant construction to vary significantly from those administered to applicants at VCSNS Unit 2 after the completion of construction. Accordingly, the NRC staff finds that because the applicant's proposed method of performing in-plant system JPMs does not cause the internal and external attributes of the operator licensing examination to vary significantly, uniform conditions are sufficiently maintained, and the alternative method is acceptable.

#### *Impact of Plant Construction on Developing Content-Valid Exams*

Using NUREG-2103 in conjunction with NUREG-1021 ensures that exams are consistently content-valid. Table 1, "Plant Systems by Safety Function," in NUREG-2103, lists each of the AP1000 plant systems associated with the nine safety functions. NUREG-1021, ES-301, Section D.4.a states that each of the three in-plant systems selected for an operating test should (1) be different and (2) be associated with a different safety function as listed in Table 1 of NUREG-2103. Administering a set of three in-plant system JPMs that are each associated with different plant systems and different safety functions maximizes the variety and



scope of in-plant system K/As that NRC examiners sample during the operating test. If the variety and scope of in-plant system K/As that NRC examiners could sample were limited for some reason, then the content validity of the operating test could be reduced.

In Enclosure 2, "Information Related to the Vogtle Electric Generating Plant (VEGP) Units 3 and 4 NRC Requests for Additional Information (RAIs) on VEGP Plant Walkthrough Exemption" of letter NND-16-0266, the facility licensee provided Table E-2, "In-Plant Task List." Table E-2 lists 91 tasks from the site-specific task list that can be used to develop an in-plant JPM at this time. These tasks have an importance rating of 2.5 or higher, can be performed using the proposed alternative method, and have procedures available. Because not all plant systems have been constructed, some procedures are not available at this time for some of the tasks on the site-specific task list. A JPM cannot be performed without a procedure. Consequently, there are in-plant tasks on the site-specific task list that have an importance rating of 2.5 or higher and cannot be used to develop a JPM at this time. To determine whether this would significantly reduce the content validity of the exam, the NRC staff performed the following actions.

First, the NRC staff reviewed the 91 tasks in Table E-2 and counted the number of tasks associated with each plant system listed in the table. Then, the staff counted how many of these plant systems were associated with each of the safety functions listed in Table 1 of NUREG-2103. The NRC staff found that an in-plant system JPM can be developed for at least one plant system associated with each of the nine safety functions except for Safety Function 3, "Reactor Pressure Control." NUREG-2103 lists two plant systems associated with Safety Function 3: the Automatic Depressurization System (ADS) and the Pressurizer Pressure Control System (PPCS). The ADS and PPCS are primarily operated from the main control room, and therefore the control room system JPMs can be used to test the applicants' knowledge of and ability to operate the two systems related to Safety Function 3. Thus, the NRC staff concludes that a set of three in-plant system JPMs that are associated with three

different plant systems as well as with three different safety functions can be developed, and therefore, the sample of in-plant tasks that exists at this time is sufficient to ensure that the examinations administered to applicants at VCSNS Unit 2 before the completion of construction and the examinations administered to applicants at VCSNS Unit 2 when construction is complete are content-valid exams.

*Impact of Alternative Method on Knowledge Retention and Learning New Knowledge*

The NRC staff has assurance that all applicants who become licensed at VCSNS Unit 2 will be trained and tested on new procedures and tasks as they become available. This is because all licensed operators are subject to the requalification requirements of 10 CFR 55.59.

These requirements include additional operating tests as follows:

(a) *Requalification requirements.* Each licensee shall —

(1) Successfully complete a requalification program developed by the facility licensee that has been approved by the Commission. This program shall be conducted for a continuous period not to exceed 24 months in duration.

(2) Pass a comprehensive requalification written examination and an annual operating test.

(i) The written examination will sample the items specified in §§ 55.41 and 55.43 of this part, to the extent applicable to the facility, the licensee, and any limitation of the license under § 55.53(c) of this part.

(ii) The operating test will require the operator or senior operator to demonstrate an understanding of and the ability to perform the actions necessary to accomplish a comprehensive sample of items specified in § 55.45(a) (2) through (13) inclusive to the extent applicable to the facility.

In other words, the applicants who receive a license will be required to take additional operating tests to maintain the license as part of the licensed operator requalification program. Therefore, the requalification program gives the NRC staff additional confidence that, as the plant is completed, operators will be continually trained and tested on operationally-important in-plant systems and tasks directed by procedures that have not been developed yet.

NUREG-1021 provides guidance for applicants transitioning from the initial license program to the requalification program: ES-605, Section C.1.b, states, “Newly licensed

operators must enter the requalification training and examination program promptly upon receiving their licenses.” Also, ES-204 states that the region may administer a license examination to an applicant who has not satisfied the applicable training or experience requirements at the time of the examination, but is expected to complete them shortly thereafter. These requirements in NUREG-1021 help to ensure that the period of time between completing all of the requirements to be licensed, which includes completing the initial license training program and passing the operator licensing examination, and entering a requalification program that meets the requirements of 10 CFR 55.59 is minimized so that applicants (1) receive refresher training on topics learned in the initial training program, which ensures knowledge retention of operationally-important topics, and (2) receive training on new operationally-important topics as they becomes available (e.g., new procedures and tasks).

In Enclosure 1, “Plant Walkthrough Exemption,” Section 6.3, “Otherwise in the Public Interest,” of letter NND-16-0266, the facility licensee stated that applicants “cannot simultaneously participate in preoperational testing activities while in ILO [initial licensed operator] classes.” As described in NEI 06-13A, Appendix A, applicants in the cold licensing process must complete at least 6 months of “practical and meaningful work experience,” which includes participation in preoperational testing, as part of the experience requirements for an operator’s license. Applicants that do not complete any or a portion of the 6 months of practical and meaningful work assignments prior to enrolling in the ILO program will have to do so before the NRC issues a license. Therefore, some applicants at VCSNS Unit 2 may not complete the requirements to be licensed “shortly” after taking the operator licensing examination. Because these applicants would not yet be licensed, under NRC regulations they would not be required to be enrolled in a training program that meets the requirements of 10 CFR 55.59, “Requalification.”

Although these applicants will be participating in practical and meaningful work assignments to gain experience with the AP1000 design, these assignments do not necessarily

ensure that these applicants will receive refresher training on topics learned in the ILO program or receive training on new topics as they become available. In accordance with 10 CFR 55.51,

If the Commission determines that an applicant for an operator license or a senior operator license meets the requirements of the Act and its regulations, it will issue a license in the form and containing any conditions and limitations it considers appropriate and necessary.

Therefore, the Commission may find it necessary to issue licenses with any conditions or limitations that may be necessary to ensure that the applicants have retained knowledge and learned new operationally-important topics during the time between completion of the operator licensing examination and issuance of the license.

In summary, as allowed by NUREG-1021, ES-201, Section B, "Background," with its exemption request, the facility licensee proposed alternatives to the examination criteria contained in NUREG-1021 with respect to the in-plant/plant walk-through portions of the operating test. The NRC staff reviewed the proposed method of administering in-plant system JPMs described in letter NND-16-0266. For the reasons described above, the NRC staff concluded that the proposed alternatives provide an acceptable method of complying with the Commission's regulations, as exempted.

If, in the future, the facility licensee desires to implement an approach that differs from the alternative described in letter NND-16-0266, then it should seek approval from the NRC.

#### *Limitations and Expiration*

The facility licensee requested the exemption from the regulation that requires the operating test to be administered in a plant walk-through because of the incomplete construction of the plant. As construction of different sections of the facility becomes substantially complete and in-plant systems, components, and structures (SSCs) near completion, use of this exemption will become unnecessary for those areas and SSCs. Accordingly, on a case-by-case basis, for those tasks that are selected to be part of an operating task in accordance with NUREG-1021, ES-301, Section D.4.a and Section D.4.b, where it is possible to both perform

OJT for an in-plant task in the plant and administer a JPM developed from that task in a plant walk-through, as determined by the NRC examiners, this exemption may not be used. Furthermore, this exemption will finally expire and may no longer be used upon the Commission's finding for VCSNS Unit 2 in accordance with 10 CFR 52.103(g) ("The licensee shall not operate the facility until the Commission makes a finding that the acceptance criteria in the combined license are met, except for those acceptance criteria that the Commission found were met under § 52.97(a)(2).").

#### *Environmental Consideration*

This exemption allows one, two, or three of the required in-plant system JPMs to be performed using discussion and performance methods in combination with plant layout diagrams, maps, equipment diagrams, pictures, and mock-ups in lieu of plant equipment. The NRC staff evaluated whether there would be significant environmental impacts associated with the issuance of the requested exemptions. The NRC staff determined the proposed action fits a category of actions that do not require an environmental assessment or environmental impact statement.

For the following reasons, this exemption meets the eligibility criteria of 10 CFR 51.22(c)(25) for a categorical exclusion. There is no significant hazards consideration related to this exemption. The NRC staff has also determined that the exemption involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite; that there is no significant increase in individual or cumulative public or occupational radiation exposure; that there is no significant construction impact; and that there is no significant increase in the potential for or consequences from radiological accidents.

Finally, the requirements to which the exemption applies involve qualification requirements. Accordingly, the exemption meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(25). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the exemption.

#### **IV. CONCLUSION**

Accordingly, the Commission has determined that, pursuant to 10 CFR 55.11, issuing this exemption from the requirement in 55.45(b) to administer a portion of the operating test in a plant walk-through is authorized by law and will not endanger life or property and is otherwise in the public interest. The Commission also has approved the facility licensee's proposed alternative to the examination criteria in NUREG-1021, ES-301, Section D.4.a and Section D.4.b and therefore will allow one, two, or three of the required in-plant system JPMs to be performed using discussion and performance methods in combination with plant layout diagrams, maps, equipment diagrams, pictures, and mock-ups in lieu of plant equipment until the Commission makes a finding for VCSNS Unit 2 that acceptance criteria in the combined license are met in accordance with 10 CFR 52.103(g).

Dated at Rockville, Maryland this 12<sup>th</sup> day of August 2016.

For the Nuclear Regulatory Commission.

Francis M. Akstulewicz, Director,  
Division of New Reactor Licensing,  
Office of New Reactors.

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